Using Ruby and irb in CSE 341
Fall 2011 (Last updated: November 28, 2011)

Overview

The last two homeworks will be using the Ruby language. We recommend editing your files in emacs and using irb, which is Ruby's REPL. This document describes basic installation and usage steps sufficient for doing your homework. Unlike when we used SML, we recommend running the REPL from a terminal (shell) window, *not* from within emacs. This is described below.

For installation purposes related to Homework 6, there are some key facts:

- You need to have some version of Ruby 1.8.7, *not* Ruby 1.9. An earlier version of Ruby 1.8 might work, but it is hard to be sure.
- You need to have a version of the Tk graphical toolkit and the appropriate Ruby libraries for using it.
- If you have emacs version 23 (the current version), you should not need to configure it in any special way for using Ruby: opening a file with extension `.rb` should use Ruby mode.

This document is long, but only because we are giving information for various operating systems and choices for using or not using resources from the department (lab machines, virtual machines, remote machines). *Just find the section that is most convenient for you.*

Also notice the last section of this document, "General information on using the REPL (or not)" which has information relevant to all operating systems.

See the course website for the main links for the Ruby language, library documentation, etc.

Using Windows in the Department Undergraduate Labs

- You do not need to install any software.
- Create a Ruby file (e.g., by downloading the provided code and renaming it) wherever is convenient (e.g., where you have been storing your other homework assignments). **Do not store it on the desktop or under `C:\` because all changes to these directories get erased when you log out. Store your files under `Z:\` (your directory on the department file system) or somewhere else (e.g., on a personal usb drive).**
- Open emacs however is convenient. You should be able to find it by, e.g., typing `emacs` in the "Search Programs and Files" from the Start Menu.
- Open your Ruby file in emacs, by dragging it from an Explorer window onto emacs, or by Ctrl-x Ctrl-f and then entering the full path to the file, or by using the File menu. Edit and save the file as usual.
- In Windows, open a command shell, either by running `cmd` (a Windows shell) or a cygwin bash shell. Use the `cd` command to switch to the directory where your Ruby file is (using the Windows shell you separate directories with backward slashes (\) and with cygwin you use forward slashes (/)). *After* you are in the right directory, type `irb` to start the Ruby REPL.

Using your own Windows machine

- If you did not install emacs version 23.3 earlier in the course, do so using the instructions for the SML portion of the course. Note you do not need SML mode — all you need to do is install emacs.
- Go to `http://www.rubyinstaller.org/`, click on the giant Download button, and click on the Ruby 1.8.7-p352 RubyInstaller (*not* a Ruby 1.9 installer).
- Run the installer.
  - Accept the License.
  - **On the next screen, click all three boxes: Install Tcl/Tk support, Add Ruby executables to your PATH, and Associate .rb and .rbw files with this Ruby installation.**
  - Then click Install.
- Create a Ruby file (e.g., by downloading the provided code and renaming it) wherever is convenient (e.g., where you have been storing your other homework assignments).
- Open emacs however is convenient, e.g., from the Start Menu.
- Open your Ruby file in emacs, by dragging it from an Explorer window onto emacs, or by Ctrl-x Ctrl-f and then entering the full path to the file, or by using the File menu. You can now edit and save the file as usual.
- In Windows, open a command shell by running `cmd` (a Windows shell). Use the `cd` command to switch to the directory where your Ruby file is (using the Windows shell you separate directories with backward slashes (\)). *After* you are in the right directory, type `irb` to start the Ruby REPL.

Using Linux in the Department Undergraduate Labs

- You do not need to install any software.
- Create a Ruby file (e.g., by downloading the provided code and renaming it) wherever is convenient (e.g., where you have been storing your other homework assignments).
- Open emacs however is convenient (one way is to find it under the large list of applications).
- Open your Ruby file in emacs by Ctrl-x Ctrl-f and then entering the full path to the file, or by using the File menu. You can now edit and save the file as usual.
- Open a command shell however is convenient (one way is to find the terminal program under the large list of applications).
- Use the `cd` command to switch to the directory where your Ruby file is (separating directories with forward slashes). *After* you are in the right directory, type `irb` to start the Ruby REPL.

Using your own Linux machine

Most Linux distributions should make it easy to install Ruby 1.8.7 and connect it to the Tk graphics library. Beware the "ruby" package, which may or may not be Ruby 1.9 — you may have to choose a ruby1.8 package explicitly. If irb is a separate package, install that too, again looking for an explicit use of 1.8. After installation, running `ruby --version` should indication ruby 1.8.7.

After installation, you can follow the instructions for, "Using Linux in the Department Undergraduate Labs."

Using the Department's Linux Virtual Machine on your machine

The department provides a Linux virtual machine that runs on your own computer no matter what operating system is on your computer. These instructions assume you already have that installed and you are "in" the virtual machine. Note that as of Fall 2011, the virtual machine requires you to have a 64-bit machine.

- Open a command shell however is convenient (one way is to find the terminal program under the large list of applications).
- Run the command `sudo yum install ruby irb ruby-tcltk`.
- You can now follow the instructions for, "Using Linux in the Department Undergraduate Labs."

Using your own Mac machine

We do not recommend trying to get Ruby to work with Tk directly under Mac OS (option 4 below). *Ruby 1.8.7 itself works fine and is probably already installed, but that is not enough for Homework 6. Success may depend on the exact version of your operating system and the graphics in homework 6 still do not work quite as expected. We recommend options 1–3.*

Option 1:

The department has made available a solution where you can connect remotely to a Windows machine just like the undergraduate lab machines. Here is what you need to know:

- This is an experimental service. The department would actually like to know if you use this and what your experience is — we will probably create a short survey about this later, but do not hesitate to report problems you have as soon as you have them.
- Follow the instructions at `http://vdi.cs.washington.edu/vdi/`. In particular:
  - You first need to install Remote Desktop Client for Macintosh computers.
  - There are at most 15 machines available remotely; go to the website to see what is currently available and connect via Remote Desktop.
  - Log in using `CSEPCLAB\yourUserName`
- When you log-off (which will happen automatically if you are idle for 1 hour), all your programs will be closed, so save your work.
- Follow the instructions above for, "Using Windows in the Department Undergraduate Labs" as the remote machine should be identical. Notice in particular where you should and should not save your Ruby file so it does not get deleted.

Option 2:

Install the department's Linux virtual machine on your Mac and then follow the, "Using the Department's Linux Virtual Machine on your machine" instructions.

Option 3:

Connect to the department's remote Linux server `attu`:

- From a terminal window, run `ssh -X attu` and log in.
- On `attu`, open emacs and your Ruby code.
- On `attu`, run irb or ruby from the command line as described below.

Option 4:

If you really want to run Homework 6 on your machine, here are steps that worked for us using OS 10.6.8 and would presumably work on 10.7 as well. The result was still imperfect: the button text in the GUI was poorly formatted, pressing the quit button crashed the program with an exception, and when using irb the gui window would hang until exiting irb. You can ignore these glitches.

Naturally you can skip any installation steps for things you already have installed.

- Install the Apple Developer Tools (for a C compiler) For Mac OS X 10.6 Snow Leopard: Get Xcode 3.2.6: `http://connect.apple.com/cgi-bin/WebObjects/MemberSite.woa/wa/getSoftware?bundleID=20792`. For Mac OS X 10.7 Lion: Get Xcode 4.2 (free in the Mac App Store)
- Install MacPorts from `http://www.macports.org/install.php`
- In a new Terminal window, install ruby 1.8.7 with the command `sudo port install ruby +mactk`
- You can now run irb via `/opt/local/bin/irb` or ruby via `/opt/local/bin/ruby`.

General information on using the REPL (or not)

- To run the code in file `foo.rb`, do `load "foo.rb"` assuming the file is in the same directory where you started irb.
- As usual, it is least error-prone to restart the REPL after editing and resaving any files you are using. Reloading a file without restarting may work depending on what has changed.
- To quit, type `quit` or `exit` (as usual in Ruby, there is more than one way to do things).
- You can cycle through previous input lines by using the up and down arrows.

You can also run a Ruby program that is in file `foo.rb` by running `ruby "foo.rb"` from the shell command-line (the place where you ran `irb`, *not* from within `irb`). For this to be useful, your Ruby file should have some top-level expression like a call to a method that is serving as your "main." Otherwise, "nothing will happen" since just defining methods has no effect until you use one of them.

On Windows and perhaps other operating systems, you can also just double-click on your `foo.rb` file to have the same effect as running `ruby foo.rb`. This approach may bring up another blank window, which you can ignore.